

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY


To:
MICHAEL E. WHITHAM
WHITHAM, CURTIS & CHRISTOFFERSON, P.C.
11491 SUNSET HILLS ROAD, SUITE 340
RESTON, VA 20190

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference 01640439TA	Date of mailing (day/month/year) 14 SEP 2004
International application No. PCT/US04/38691	International filing date (day/month/year) 19 November 2004 (19.11.2004)
Applicant VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.	

1.	<input checked="" type="checkbox"/>	<p>The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.</p> <p>Filing of amendments and statement under Article 19: The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):</p> <p>When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.</p> <p>Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 740 14 35</p> <p>For more detailed instructions, see the notes on the accompanying sheet.</p>
2.	<input type="checkbox"/>	<p>The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.</p>
3.	<input type="checkbox"/>	<p>With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:</p> <p><input type="checkbox"/> the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.</p> <p><input type="checkbox"/> no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.</p>
4.	<p>Reminders</p> <p>Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.</p> <p>The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.</p> <p>Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.</p> <p>In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months.</p> <p>See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the <i>PCT Applicant's Guide</i>, Volume II, National Chapters and the WIPO Internet site.</p>	
Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer Robert Sellers  Telephone No. (571) 272-1700

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 01640439TA	FOR FURTHER ACTION <small>see Form PCT/ISA/220 as well as, where applicable, item 5 below.</small>	
International application No. PCT/US04/38691	International filing date (<i>day/month/year</i>) 19 November 2004 (19.11.2004)	(Earliest) Priority Date (<i>day/month/year</i>) 20 November 2003 (20.11.2003)
Applicant VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. ☐

With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☒ **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. _____



as suggested by the applicant.



as selected by this Authority, because the applicant failed to suggest a figure.



as selected by this Authority, because this figure better characterizes the invention.

b. ☒

none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/38691

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.: 1-9
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

- The additional search fees were accompanied by the applicant's protest.
No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/38691

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C08L 81/06; H01M 6/18, 8/10

US CL : 429/33, 314; 525/534, 535

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 429/33, 314; 525/534, 535

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2003/46080 A1 (KINOCHI et al.) 05 June 2003 (05.06.2003), page 2, paragraphs 18 and 19 and page 15, paragraphs 212-214.	4-9
X	US 2002/0091225 A1 (MCGRATH et al.) 11 July 2002 (11.07.2002), page 1, paragraph 3, page 2, top chemical structure and paragraph 14.	4-9
---		-----
Y		1-3
X	US 6,503,378 A (FISHER) 07 January 2003 (07.01.2003), column 2, lines 28-34; column 4, lines 11-16 and 18-28.	4-7
X	US 5,128,378 A (SUGAYA et al.) 07 July 1992 (07.07.1992), column 1, lines 10-11; column 2, lines 19-25; column 3, lines 18-23 and 31-47; and column 4, lines 10-18.	4-7
Y	US 5,115,082 A (MERCER et al.) 19 May 1992 (19.05.1992), column 6, repeating unit (A), column 12, lines 38-45 and column 12, lines 20-21.	1-3
P,X	CAPLUS accession no. 2004:234147, Ghassemi et al., New multiblock copolymers containing hydrophilic-hydrophobic segments for proton exchange membranes, Polymer Preprints, 2004, Vol. 45, No. 1.	1-9



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

24 August 2005 (24.08.2005)

Date of mailing of the international search report

14 SEP 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

Robert Sellers

Telephone No. (571) 272-1700

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/38691

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	Lee et al., Preparation and evaluation of sulfonated-fluorinated poly(arylene ether)s membranes for a proton exchange membrane fuel cell (PEMFC), Electrochimica Acta 49, 14 January 2004, pages 2315-2323.	4-9
P,X	US 2004/0186262 A1 (MAIER et al.) 23 September 2004 (23.09.2004), page 1, paragraphs 7-12.	4-9
P, X	US 2004/0101730 A1 (HIRANO et al.) 27 May 2004 (27.05.2004), page 2, paragraphs 16 and 18; and page 4, paragraphs 56-57.	4-7 and 9
P,A	CAPLUS accession no. 2003:211268, WILES et al., Poly(arylene thioether sulfone) copolymers for PEM-based fuel cell systems. Polymer Preprints, 2003, Vol. 44, No. 1.	4-9
P,A	CAPLUS accession no. 2004:234143, BAI et al., Properties and proton conductivities of highly sulfonated polyarylenethioethersulfones for fuel cells, Polymer Preprints, 2004, Vol. 45, No. 1.	4-7 and 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/38691

Continuation of B. FIELDS SEARCHED Item 3:

CAS Online: Files REG and CAPLUS

EAST: Databases US-PGPUB, USPAT, USOCR, EPO, JPO, DERWENT and IBM-TDB

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
MICHAEL E. WHITHAM
WHITHAM, CURTIS & CHRISTOFFERSON, P.C.
11491 SUNSET HILLS ROAD, SUITE 340
RESTON, VA 20190

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference 01640439TA		Date of mailing (day/month/year) 14 SEP 2005
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/US04/38691	International filing date (day/month/year) 19 November 2004 (19.11.2004)	Priority date (day/month/year) 20 November 2003 (20.11.2003)
International Patent Classification (IPC) or both national classification and IPC IPC(7): C08L 81/06; H01M 6/18, 8/10 and US Cl.: 429/33, 314; 525/534, 535		
Applicant VIRGINIA TECH INTELLECTUAL PROPERTIES, INC.		

1. This opinion contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|--|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the opinion |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input checked="" type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

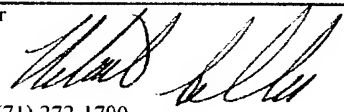
2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Robert Sellers  Telephone No. (571) 272-1700
--	---

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/38691

Box No. 1 Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/38691

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:
- ☒ paid additional fees
 - ☐ paid additional fees under protest
 - ☐ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
See the lack of unity section of the International Search Report (Form PCT/ISA/210)

4. Consequently, this opinion has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-9

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US04/38691

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-3</u>	YES
	Claims <u>4-9</u>	NO
Inventive step (IS)	Claims <u>1-3</u>	YES
	Claims <u>1-9</u>	NO
Industrial applicability (IA)	Claims <u>1-9</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 4-9 lack novelty under PCT Article 33(2) as being anticipated by PCT Publication No. WO 2003/46080 as represented by U.S. Publication No. 2005/0069780 (KINOUCHI et al.) or U.S. Publication No. 2002/0091225 (MCGRATH et al.)

KINOUCHI et al. (page 15, paragraphs 212-214, Synthetic Example 2) shows a sulfonic acid group-containing aromatic polyether sulfone block copolymer useful as a cationic polymer electrolyte membrane (page 2, paragraphs 18 and 19) containing a hydrophobic segment prepolymer a1 derived from bis(4-fluorophenyl)sulfone and bisphenol S block copolymerized with a sulfonic acid group-containing hydrophilic segment polymer b1.

MCGRATH et al. discloses a proton exchange membrane (page 1, paragraph 3) prepared from a disulfonated poly(aryl ether sulfone) having the formula depicted at the top of page 2 wherein Y is a sulfonate group and Z is a -C(CF₃)₂- substituent (page 2, paragraph 14).

Claims 4-7 lack novelty under PCT Article 33(2) as being anticipated by U.S. Patent No. 6,503,378 (FISHER) or U.S. Patent No. 5,128,378 (SUGAYA et al.).

FISHER sets forth a polymer electrolyte membrane (col. 2, lines 28-34) obtained from a block copolymer with hydrophobic blocks (col. 4, lines 11-16) and sulfonic acid groups-containing hydrophilic blocks (col. 4, lines 18-28).

SUGAYA et al. reports a cation exchange membrane (col. 1, lines 10-11) produced from a sulfonated (col. 2, lines 19-25 and col. 4, lines 10-18) aromatic polythioethersulfone containing biphenyl groups (col. 3, lines 18-23 and 31-47 wherein Ar in the formula is a biphenyl and Y is a single bond; and col. 9, Example 1).

Claims 1-3 lack an inventive step under PCT Article 33(3) as being obvious over U.S. Publication No. 2002/0091225 (MCGRATH et al.) in view of U.S. Patent No. 5,115,082 (MERCER et al.).

MCGRATH et al. is described hereinabove. The claimed octafluorobiphenyl moiety of the chemical structure is not recited. MERCER et al. shows a fluorinated poly(arylene ether) containing a bisphenol AF-octafluorobiphenyl repeating unit (column 10, lines 38-45).

It would have been obvious to modify the biphenyl repeating unit of MCGRATH et al. to the octafluorobiphenyl radical of MERCER et al. in order to improve the high temperature stability (column 12, lines 20-21).

Claims 1-9 meet the criteria set out in PCT Article 33(4), and thus demonstrates industrial applicability because of its use in the fabrication of a proton exchange membrane.

UNITED STATES RECEIVING OFFICE (RO/US) FEE CODING AND RECORDING SHEET

☐ ADD'L SHEET

IDENTIFICATION OF THE INTERNATIONAL APPLICATION

INTERNATIONAL APPLICATION NUMBER

INTERNATIONAL FILING DATE

PCT/US04/38691

19, November 2004

APPLICANT (Name)

Virginia Tech Intellectual Properties, INC

PAYMENTS

REFUNDS

Payment on Filing				Deposit Account	Deposit Account	To Deposit Account	To Deposit Account
				50	2041		
DATE:				DATE:		DATE:	
8-22-05							
<input type="checkbox"/> CASH/CHECK				<input type="checkbox"/> CASH/CHECK		<input type="checkbox"/> BY CHECK	
160				1604	1000		
151							
153							
800							
891							
802							
892							
Total Paid:				Total Paid:		Total Refunded:	
				1000			
States Included for 892:				892:			
States Included for 893:				893:			

Date Mailed:

RO/US Authorization

RO/US Authorization

RO/US Authorization

RO/US Authorization

RO/US Authorization

CHAPTER I
PCT TELEPHONE MEMORANDUM
FOR
LACK OF UNITY OF INVENTION



PCT No.: PCT/US04/38691

Examiner: Robert Sellers

Attorney spoken to: Ruth Tyler-Cross

Date of call: 22 August 2005

- ☒ Amount of payment approved: 1000
- ☒ Deposit account number to be charged: 50-2041
- ☐ Attorney elected to pay for ALL additional inventions
- ☒ Attorney elected to pay only for the additional inventions covered by
- ☒ Group(s): I and II
- encompassing --
- ☒ Claim(s): 1-9
- ☐ Attorney elected NOT to pay for any additional inventions, therefore, only the first claimed invention (Group I) covered by Claim(s) _____ has been searched.
- ☒ Attorney was orally advised that there is no right to protest for any group not paid for.
- ☒ Attorney was orally advised that any protest must be filed no later than 15 days from the mailing of the Search Report (PCT/ISA/210).

Time Limit For Filing A Protest

Applicant is hereby given 15 days from the mailing date of this Search Report in which to file a protest of the holding of lack of unity of invention. In accordance with PCT Rule 40.2, applicant may protest the holding of lack of unity only with respect to the group(s) paid for.

Detailed Reasons For Holding Lack of Unity of Invention:

Please See Continuation Sheet

Note: A copy of this form must be attached to the Search Report.

**ATTACHMENT TO CHAPTER I PCT TELEPHONE MEMORANDUM
FOR
LACK OF UNITY OF INVENTION**

Continuation of Detailed Reasons For Holding Lack of Unity of Invention:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

- Group I, claims 1-3, drawn to a multiblock copolymer..
- Group II, claims 4-9, drawn to a proton exchange membrane.
- Group III, claims 10-21, drawn to a method of making a multiblock copolymer.
- Group IV, claims 22-25, drawn to an ion-exchange membrane.
- Group V, claims 26-28, drawn to a fuel cell.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical feature. The special technical feature is the multiblock copolymer having the chemical structure of claim 1.

U.S. Publication No. 2002/0091225 (MCGRATH et al.) discloses a disulfonated poly(aryl ether sulfone) having the formula depicted at the top of page 2 wherein Y is a sulfonate group and Z is a $-\text{C}(\text{CF}_3)_2-$ substituent (page 2, paragraph 14).

The claimed octafluorobiphenyl moiety of the chemical structure is not recited. U.S. Patent No. 5,115,082 (MERCER et al.) shows a fluorinated poly(arylene ether) containing a bisphenol AF-octafluorobiphenyl repeating unit (column 6, repeating unit (A)) which can be combined with another polymer to form a block copolymer (column 10, lines 38-45).

It would have been obvious to modify the biphenyl repeating unit of MCGRATH et al. to the octafluorobiphenyl radical of MERCER et al. in order to improve the high temperature stability (column 12, lines 20-21).

Accordingly, the special technical feature does not make a contribution over the prior art, thereby validating a holding of lack of unity between the inventions.

Note: A copy of this form must be attached to the Search Report.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.